



Editorial

Well, I guess this issue of UpTime has finally made it to your doorstep. We ended up about two weeks behind schedule due in part to the CoCoFest and partially due to a few billing problems which we have been trying to iron out. Hopefully we will be back on schedule for the June and July issues... please try to bear with us!

Traditionally, the summer months have been the slow months for the CoCo market because of the number of developers and users who like to spend a little time out of doors. However, there are two new (or relatively new) packages that have recently been introduced. The first is the **Home Pak** for OS-9, written originally by Terry Simons and ported to OS-9 by Chris Dekker. This package includes all of the features of the original RS-DOS version and more. Contact Terry Simons (from the MI&CC club advertisement elsewhere in this magazine) for more information. Also, Jeff Vavasour has recently released a **CoCo II Emulator** for the IBM PC. What this allows you to do is run all of your CoCo programs on the IBM system, often at speeds exceeding the original



It's about that time again...

CoCo rate. You may obtain a copy by sending \$5 to Rick's Computer Enterprises, whose address is contained in an advertisement elsewhere in the magazine. Rick is also trying to form a **mailing list of CoCo users**— to help out, simply fill out the form provided in his advertisement and mail it in. You can later purchase a disk containing the information gathered at a very modest price, and you may receive mailings from other advertisers which choose to use it as a source for direct mailings.

Recently, a few users have asked where they may obtain the **Planet Engine** program from Lee Veal. We could not contact Lee directly or indirectly, and at the time I received some information that said the MI&CC club was distributing that as part of their library. Since then I have talked with Dave Wordell and Lee Veal himself, so here is the official distribution information from Dave Wordell:

The program was written by and is still owned by Paul Light. He has licensed DalTrug, our local club, as the sole distributor of this product. Lee Veal, a member in good standing, goes to various Fests and distributes the product there. I'm not sure if Lee would have the time to process orders at his home, but I certainly would be glad to if he cannot. We sell the program for \$25 plus \$2 shipping and handling.

The program requires the Tandy Color Computer 3 and the OS-9 Level 2 Operating System with 128K minimum memory. The program is ideally run with 512K of memory from the Multi-View window with a mouse and a color monitor.

David A. Wordell
833 Woodhaven Lane
Grand Prairie, TX 75051.

So there you have it— if you would like to order the program, please drop Dave a line. Until next month, have a great summer!

Jordan Tsvetkoff

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UpTime

Editor: Jordan Tsvetkoff

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Basic09 in ?? Easy Steps

Today I will discuss the matter of setting up graphics windows in Basic09. It is, after all, a little bit of a disillusion if you have a wonderful program but can't get its output on the screen. From Basic09, you have access to 2 text screens (40 and 80 column) and 4 types of graphics screens.

If you are familiar with DECB you will see that these choices coincide with the so called high resolution screens made available with the introduction of the CoCo 3. You can also access the older low and medium resolution screens from within Basic09 through the Gfx module, but I doubt many people are interested in using those.

So here we will focus on accessing the high resolution screens. As I stated earlier you cannot access the screens directly from within Basic09, but you must use a module called Gfx2. Well, that is what we begin with anyway. This module doesn't really deal with the windows, but it allows you to use English language commands to tell the computer what to do. It translates those commands, checks any parameters that you may have used and then tries to

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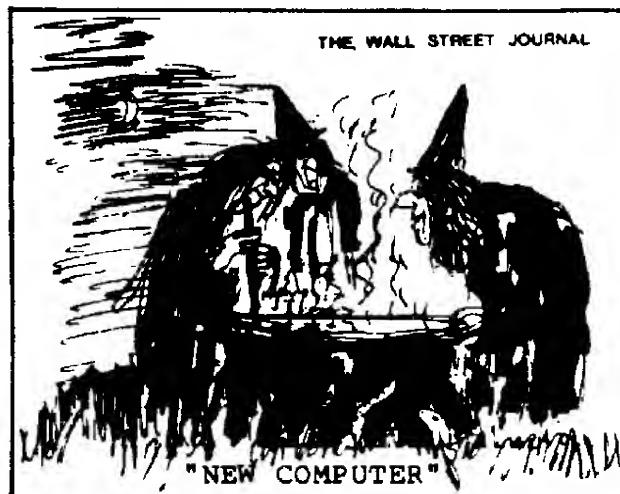
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run the appropriate ML subroutine(s) to execute your idea. The actual subroutines are found in a module called Grfdrv, so make sure you load this module into memory if you want to work with



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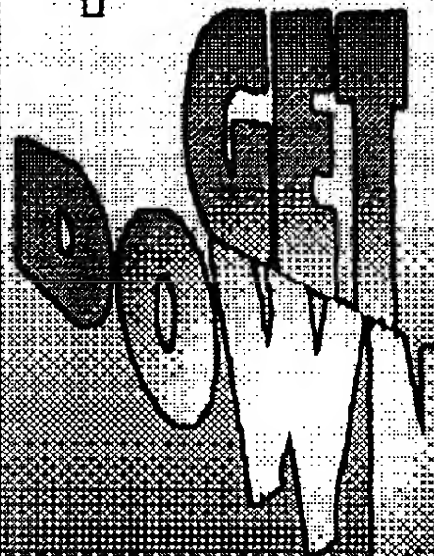
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windows.

There is sometimes confusion about screens and windows, not in the least because it is very easy to mix both words in a text (or sentence) in such a way that their real meaning gets changed. Technically speaking though, the screen is the physical (monitor) screen you are looking at. A window is that part of the screen the computer uses for its output. It is analogous to a window being the part of a wall you can look through. (unless, of course you are super(wo)man)!

This is a very important distinction under OS-9 (and Basic09) and makes for a powerful programming tool. You can, for instance, put 3 or 4 windows on one screen and run a program in each of the windows. This way you can keep an eye on all of them without ever touching a key.

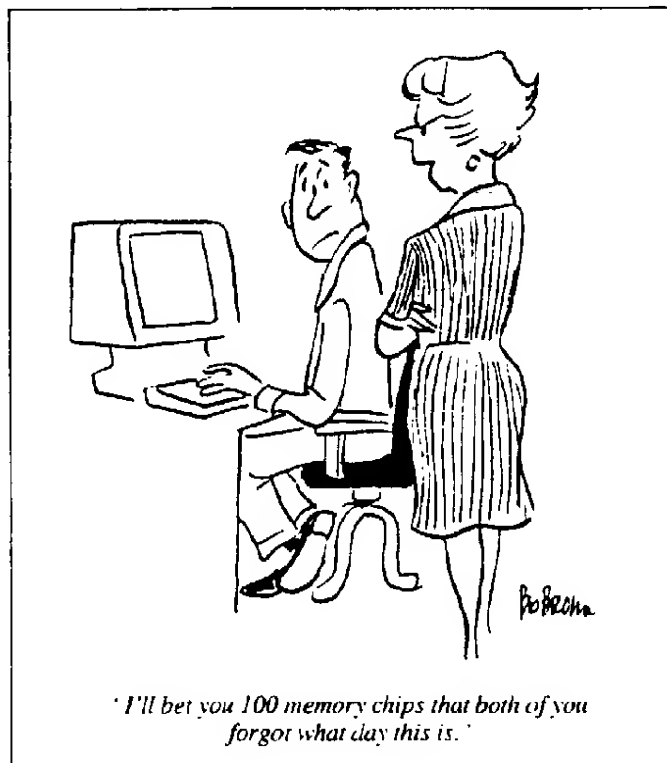
However, we will start out doing something easier. The following listing is a program that draws about 1000 circles on the screen arranging their size and place in such a way that it forms a symmetrical structure. Actually this structure is called a Pythagoras tree, although I am not exactly sure why.

```
PROCEDURE pyth
BASE 0
DIM path,RI,x3,y3,x4,
    y4,col(11):INTEGER
DIM RA(11),XA(11),
    YA(11),Z(11):REAL
ON ERROR GOTO 200
OPEN #path,"/w1":WRITE
RUN gfx2(path,"dwset",
```

```
8,0,0,40,24,1,2,2)
RUN gfx2(path,"curoff")
RUN gfx2(path,"select")
P=10 \C=.5 \E=SQRT(C)
FOR i=1 TO P
READ col(i)
NEXT i
DATA 0,9,1,10,2,12,4,
    14,9,1,10,2,12,4,14
X=0 \Y=1 \M=0 \G=0 \R=C
REPEAT
IF G<P THEN
M=M+1 \G=G+1
GOSUB 100
X=X1 \Y=Y1 \R=E*R
XA(M)=X2 \YA(M)=Y2
Z(M)=G \RA(M)=R
ELSE
X=XA(M) \Y=YA(M)
G=Z(M) \R=RA(M)
M=M-1
ENDIF
UNTIL M<0
RUN gfx2("select")
CLOSE #path \ END
100 X1=C*(X-Y+1)-1
```

```
Y1=C*(X+Y+1)
X2=C*(X+Y-1)+1
Y2=C*(-(X)+Y+1)
x3=320+X1*640/4.8
y3=116-Y1*192/3.6
x4=320+X2*640/4.8
y4=116-Y2*192/3.6
RI=130*R
RUN gfx2(path,"color",
    col(G))
RUN gfx2(path,"circle",
    x3,y3,RI)
RUN gfx2(path,"circle",
    x4,y4,RI)
RETURN
200 errnum=ERR
RUN gfx2("select")
CLOSE #path
```

For the time being I won't go into the whys and whats of all the formulas, variables, etc. I first want to concentrate on the screen commands. OS-9 considers a window a device, just like a printer or a disk drive. For this reason, you cannot directly access the screen



'I'll bet you 100 memory chips that both of you forgot what day this is.'

The

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The COCO TRADER is a news letter for buyers, sellers, and traders of any COLOR COMPUTER related items. Since Tandy has dropped the COLOR COMPUTER, and since the demise of The Rainbow, and so many software dealers, it is hard to find alot of the items that you may be looking for. So the COCO TRADER will be a place to find them.

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Since the disappearance of the RAINBOW, no publication or organization has been able to reach all sectors of the CoCo Community. Hence, we have lost track of many who are still actively using their CoCos. The many different groups that still support the CoCo have made it possible for our computer to stay active and relatively strong...but there is a need for centralization. A new effort to alleviate that situation is the CoCo Registry Project. We invite, beg, implore you to make yourself known by filling out the enclosed questionnaire and mailing it to the address given.

From the returned forms a valuable database will be created and made available to all at a very affordable fee. This proposed database will be valuable to CoCo companies as they make the members aware of their products. It will also serve it's members as a database of interests and locations. I feel that this project will be of great value and interest to all CoCoists.

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UpTime

May 1994

but you must open a communications line with the device. This is done with the **OPEN** statement. As you can see this program uses a device called **/w1**. If you are not sure which window you can use you can address it as **/w**. This is a generic descriptor which tells OS-9 to use the first window that is available.

After we open the path, we must establish the type of window we want to use. This is done with the first call to **gfx2**. **DWSET** tells **gfx2** we want to **SET** up a Device Window. The numbers define the window, while the path variable tells **gfx2** where to set up the window.

The numbers are defined as follows:

- 8 - screen type: 320x192, 16 colors
- 0,0 - coordinates upper left corner of window
- 40 - width of window in columns (=320 pixels)
- 24 - height of window in lines (=192 pixels)
- 1 - register number of foreground color
- 2 - register number of background color
- 2 - register number of border color

Note that under **DECB** you would use the **HSCREEN 2** command to achieve the same results. We don't want a blinking cursor in a corner of the screen so we turn it off with the **CUROFF** command. Then we want to actually see the new window which is accomplished by the **SELECT**

command.

I will tell you right here to be very careful with this command. It not only shows the window, but it also sends any key presses to that window and no longer to our program. Under normal circumstances this is not a problem, but if you are debugging the program and have a **PAUSE** statement inserted somewhere, the program will execute until it encounters the **PAUSE** and wait for your input. But since you are looking at the image and cannot send input to the program, the whole thing is deadlocked. If you have multiple shells running, you can kill the program and then restart **Basic09**, reload the program and try again. If you don't have any other shells running, it's going to be a trip to the reset button.

The easiest way to prevent these problems is to put the following line just before the pause: **run gfx2("select")**. This will switch the keyboard back to the program and allow you to proceed. Also make sure you have the same statement in your error trapping routine (for obvious reasons).

To round off the **SELECT** statement: if you execute it *before* you close the path to the window, the screen display will switch back to your program. If you close it *after* you close the path, OS-9 will link the keyboard back to the program but continue to display the graphics image. You must then press the **CLEAR** key to switch the display.

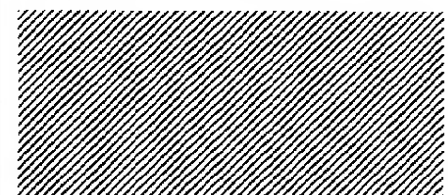
The three lines near the

bottom of the subroutine set the color and draw the circles. We must first use the **COLOR** statement because you cannot specify the color with the **CIRCLE** command as you would under **DECB**. As far as **Gfx2** is concerned, a circle is a circle and nothing else. If you want to specify a color, you must use a different call, and if you want to draw off-beat circles, you must use the **ELLIPSE** function. So in our program we just have to specify the centerpoint and the radius.

Before we move on: one more thing about windows. This program works fine because we have not **INIZialized** the window (or used an **ISAttach** system call) before opening the path to the window. If you type **INIZ w1** at the **OS9:** prompt before running the program, you will get an error 184 message. The reason for this is that you can establish only one device window per device. If you still want the program to run hassle free you must trap that error, execute a **run gfx2(path,"dwend")** statement and loop to the **dwset** statement. Alternately, if you send the **dwend** command to a non-existing window, you will get error 196 upon which you can loop back to the **dwset** statement.

Oh, and please do some experimenting before you move on!

- Chris Dekker



Life on the Internet

In the last installment of this column, we went into some of the background information on the Internet. Basically, the Internet is a global network connecting millions of computers. In the beginning, its sole purpose was to connect various military, governmental, and educational institutions for the purpose of research. Since then, the market has expanded into the commercial sector, and in the next few years, products of the Internet will probably be affecting many of us.

When the net was first developed, various standards had to be set so that the computers connected to the net would be able to communicate easily with one another. At the very lowest level, a protocol called Transmission Control Protocol/Internet Protocol (TCP/IP) was chosen to be the primary carrier of packets across the network. To understand what a packet is, imagine that each computer is a person and everyone communicates by yelling one word of their thoughts at one other person. Now, each word that you yell can be considered a packet. By listening for packets and combining them into the original sentence, the other person can reconstruct your speech even though they didn't hear the entire sentence at one time. This is essentially how all traffic on the Internet (and in fact most computer networks) is handled.

Now to carry this analogy a little further, let's look at how the network is organized physically.

The Internet itself can be considered a network of networks... each network, such as one university's net, is connected to other local networks. Imagine a building with many individual rooms and various people in each room. Consider each room to be a local network and the various people to be computers connected to their respective local nets. Now, when somebody wants to talk to somebody else in the room, they simply speak up and hope that the other person heard them. This is one of the essential artifacts of the Internet- there is no guarantee that your message got through- the packet can get garbled, or two people could be trying to yell at the same time. In order to be sure, you would have to have worked out a system with the other person where your partner would then yell back something to the effect of "Yes, I heard you... you don't have to tell me again." If you do not hear this within a certain amount of time, you may try to yell out the information again. You can see that many problems could arise, such as the person hearing you the first time and yelling that they heard you, but their confirmation itself gets lost, and you yell the information again. For some types of information, this is fine. But for something touchy, such as the ATM machines at your local bank, you would only want to convey the message "Delete \$100 from Joe's account" only once.

Now, when you want to communicate with somebody in another room, it is highly doubtful that you will be able to yell out loud enough to get to them. In addition, if everybody was on the same local network, there would be so much

yelling going on that nobody would ever be able to get a good message through. For these reasons, only so many computers are put together on the same network, and these local networks are connected together with devices called routers. A router listens to all of the messages on both of the networks it is connecting, and passes only those messages that are not intended for the same network. In this way, the "yells and screams" from one network will not spill over into the other network. Only a carefully controlled traffic stream will actually make it across. This would be similar to guards at each door in our building which did not let anybody speak directly to anybody on the other side, but instead listened for messages to the other side and repeated those messages when necessary. By using this scheme, it is quickly easy to see how the thousands of networks that make up the Internet do not clog up from all of this information- most network traffic remains inside each local network, and only the few messages intended for other nets has to be transmitted between sites.

Currently, the backbone of the network is run by the National Science Foundation and is called NSFNet. Most of the local networks feed into regional distribution nodes of the NSFNet, and the NSFNet takes care of moving packets at the regional (and international) level. Lately, however, a lot of consumer and commercial traffic has begun to appear on the net, which has led to some questions about who should be footing the bill for this backbone. Of course, it is mostly supported

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by governmental funds at this point (imagine that, you tax dollar actually working *for* you!) but may be moved to the commercial sector in the future.

And just how the heck does everybody know how to address each other? After all, there are literally millions of computers to choose from when you send a packet of information out. TCP/IP is based on a 32-bit addressing protocol which allows for a possible 4,294,967,296 unique addresses at any one time. Each network site is allotted a range of numbers which they can then distribute to all of the computers on their local networks. Special routing protocols enable a packet to find its way to any destination... as a gross example, a higher level router may know that any packets beginning with a certain code all go to one particular site, so it is relatively easy to direct those packets to their destination. In fact, addresses are usually given in one of two ways: the dot specification or the name specification. For the dot specification, the 32-bit address is broken into four 8-bit sections. You may know from your binary arithmetic that 8-bits can be represented by the numbers 0 to 255, and that is exactly how it is done. For example, 128.2.10.5 is a valid Internet address. However, it is extremely difficult to remember strings of numbers, so a naming system was developed. It too separates individual names with dots, but these separations are purely hierarchical and do not correspond to any bit sections of the actual address. For example, *sumex-aim.stanford.edu* is a valid address for a computer at Stanford

University that provides a large library of public domain software to anyone on the net. Typically, you can tell where these addresses are coming from by looking at the rightmost identifier. *Edu* represents an educational institution, usually a university, *com* is a commercial user, *mil* is a military institution, and *gov* is a governmental branch. Outside of the United States, you typically have an international identifier tacked on to the end, such as *au* for Australia or *no* for Norway. The rest of the address depends upon the individual site, and names range from the understandable (as the Stanford one appears to be) to the indecipherable.

In order to resolve a name, your computer will typically send out a Domain Name Server (DNS) query to translate an address name that you type into the actual 32-bit number. Basically, if the computer is on your local net, a local name server will translate the address

directly and send the result back immediately. However, a name from a remote institution will typically get sent to that institution (through various higher level routers which can use part of the name to get the request to the correct name server). Eventually the numbered address is returned to your computer which can then use this number to address all of its outgoing packets.

Well, that turned out to be a little more in-depth than I was planning, but at least that gives you a really good look at how the Internet actually operates. In the next installment, I hope to get to some of the higher level protocols, such as electronic mail applications and the transferring of files across the network.

- Jordan Tsvetkoff



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